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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,877	10/16/2006	Yasuaki Takeuchi	29137.058.00	5375

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EXAMINER	
WALKER, KEITH D	

ART UNIT	PAPER NUMBER
1795	

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07/12/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/529,877	TAKEUCHI ET AL.	
	Examiner	Art Unit	
	KEITH WALKER	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 May 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 4-13* is/are pending in the application.

4a) Of the above claim(s) *4* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 5-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/19/10*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Claims 2 & 3 are cancelled and claim 4 is withdrawn. Claims 1 & 5-13 are pending examination as discussed below.

Information Disclosure Statement

The information disclosure statement filed on 1/19/10 has been placed in the application file and the information referred to therein has been considered as to the merits.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 1 & 5-13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Regarding claim 1, the limitation is drawn to a solid electrolyte membrane that consists of one or plural kinds of layered silicate minerals. As such, the claim limits the membrane to only one or plural kinds of layered silicate minerals. The instant specification describes the layered silicate mineral as "a proton conductive inorganic

material under a suitable condition." (page 5) The silicate mineral is further described as being used as a suitable electrolyte if "the density and impregnated liquid contents are properly controlled" (pages 5 and 6). However, the instant disclosure does not provided any working examples that illustrate how to control the density and impregnated liquid contents of a layered silicate mineral to make a solid electrolyte membrane. No direction is provided by the inventors as to what suitable density and liquid contents are required or suitable to make or use a solid electrolyte with any of the possible combinations of layered silicate minerals. The breadth of the claims is broader than the description of the instant specification. The instant claims are drawn to plural kinds of layered silicate minerals. The layered silicate minerals include a large group of minerals that include at least the subgroup of phyllosilicates, which has about 30 types. However, applicant has only mentioned 4 kinds of layered silicate minerals in the instant specification and of those 4 kinds, there are no examples provided with any of the 4 and no description as how all the other layered silicate minerals claimed would act in accordance with the 4 kinds described. An undue amount of experimentation would be required since a number of unknown variables exist such as the method of creating the solid electrolyte that consists of layered silicate minerals and the factors or data that are used to control the density and liquid contents for all the different kinds of silicate minerals both individually and combined, as claimed. The instant disclosure does not properly describe the invention in such a manner to enable one of ordinary skill in the art to make or use the invention as claimed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 & 5 are rejected under 35 U.S.C. 102(b) as being anticipated by US 3,266,940 (Caesar).

Caesar teaches a fuel cell with an anode, cathode and solid electrolyte membrane consisting of a layered silicate mineral (Fig. 1; 1:1-30, 1:35-40, 1:70-2:10). An example of the electrolyte material is mordenite and the electrolyte membrane may or may not have a support structure (2:25-45, 3:5-20, 4:10-20).

3. Claims 1 & 5 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 93/08613 (Krumpelt).

Krumpelt teaches a fuel cell with an anode, cathode and solid electrolyte membrane consisting of a layered silicate mineral (Abstract, pages 6-7).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 6-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 3,266,940 (Caesar).

The teachings of Caesar as discussed above are incorporated herein.

Caesar is silent to anode, cathode and water separators.

However, these features are well known in the art for the efficient operation of the fuel cell system. The anode and cathode separators are known for distributing fuel and oxidant across the electrode surface and are usually conductive to electrically connect the electrodes together producing a fuel cell stack with a particular electrically arrangement. The water separator is used for maintaining an appropriate operating temperature for the fuel cell stack. A coolant is channeled through the water separator and then through a heat exchanger to keep the fuel cell from overheating.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the fuel cell of Caesar with the anode, cathode and water separators because these elements are well known in the art and are used for their known purpose. Combining prior art elements according to known methods to yield predictable results and using known techniques to improve similar devices in the same way are considered obvious to one of ordinary skill in the art (KSR, MPEP 2141 (III)).

Regarding the limitations to the type of fuel used to operate the fuel cell, these limitations are directed to the intended method of operating the fuel cell and do not further limit the physical structure of the claimed product. It is held that a recitation with

respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus satisfying the claimed structural limitations (MPEP 2114). Furthermore, all of the claimed fuels are known fuels for the intended use with a fuel cell.

5. Claims 6-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 93/08613 (Krumpelt) in view of US 4,505,992 (Dettling).

The teachings of Krumpelt as discussed above are incorporated herein.

Krumpelt is silent to an anode, cathode or water separator.

Dettling teaches a fuel cell stack with an anode, cathode and water separator plate for distributing fuel, oxidant and cooling medium to respective elements of the fuel cell stack (Abstract; Fig. 1; 5:40-6:10). These elements are well known elements of a fuel cell stack and are shown as being used for their intended purpose with known, obvious and expected results.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the fuel cell of Krumpelt with the anode, cathode and water separator plates of Dettling to perform the intended and known purpose of each of the plates.

Regarding the limitations to the type of fuel used to operate the fuel cell, these limitations are directed to the intended method of operating the fuel cell and do not further limit the physical structure of the claimed product. It is held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does

not differentiate the claimed apparatus from the prior art apparatus satisfying the claimed structural limitations (MPEP 2114). Furthermore, all of the claimed fuels are known fuels for the intended use with a fuel cell. Dettling also teaches using hydrogen containing fuels, including hydrogen itself, are well known in the art (1:25-30, 5:10-15).

Response to Arguments

Applicant's arguments with respect to the amended claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEITH WALKER whose telephone number is (571)272-3458. The examiner can normally be reached on Mon. - Fri. 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Keith Walker/
Primary Examiner, Art Unit 1795